

### **Specification Amendments**

Please replace the paragraph beginning on page 4, line 10, with the amended paragraph, as follows:

The present invention provides high-density memory storage utilizing directed light beams to read data in the memory storage by generating a flow of carriers, and that includes enhancing structure and methods for affecting the carrier transport to improve the sensing and detection of data while minimizing error. "Carriers" as used herein refers to electrons, holes, and/or photons that are generated by the impact of photons on semiconductor materials in one of the layers described herein. "Carrier transport" as used herein refers to the movement or flow of carriers through a medium. The enhancing structure is a layer (LASL) adjacent the storage layer ~~(LASL)~~ that contributes to or affects the carrier transport at a detection point to improve detection and lower the possibility of error.

Please replace the paragraph beginning on page 4, line 33, with the amended paragraph, as follows:

A layer (LASL) adjacent to the data storage layer ~~(LASL)~~ is provided for generating or affecting the flow (transport) of carriers during the read phase. In addition the LASL may improve the electrical, optical or thermal properties of the device stack, either through its own electrical, optical or thermal properties, or by improving the properties of the storage layer. The carrier generation and transport in the LASL may be the result of direct impact of beams from the beam emitters, carrier transport from the data storage layer, and/or an electric field impressed on the LASL or the storage layer. A detection region in communication with the data storage areas or with the LASL is provided for determining the activity of the electron-hole pairs during the read phase, the activity of the electron-hole pairs being relative to the state of each storage areas. A detector senses the electron-hole pair activity in the detection region to determine the state of each storage area.

Please replace the paragraph beginning on page 10, line 16, with the amended paragraph, as follows:

Figures 2 and 3 illustrate the principle of the LASL in two different implementations within the environment shown in Figure 1. An additional layer (LASL) is provided adjacent to the storage layer (~~LASL~~) for the purpose of generating carriers and/or affecting the location and efficiency of generation of carriers by the light beams during the read mode and/or the flow of these carriers after generation. This concept may be applied in a variety of different devices for sensing carrier transport, including but not limited to a semiconductor diode, a photoconductive region and a photo-luminescent region, as further described herein.

Please replace the paragraph beginning on page 18, line 8, with the amended paragraph, as follows:

Referring now to Figure 7, a preferred embodiment of a method 90 of the present invention is shown. At step 92, a data storage unit is provided including a data storage layer having a data storage area with data thereon. Next at step 94 a layer (LASL) adjacent to the storage layer (~~LASL~~) is preferably disposed adjacent to the data storage area. At step 96, a light beam is directed from a light beam emitter toward the LASL and the data storage layer. Next at 98, a portion of the light beam is filtered as the light passes through the data storage area, the filtering being in a variable amount depending on the state of the data storage area, thereby reading said data from the data storage area. At step 100, carrier flow is generated in the LASL corresponding to the amount of light reaching the LASL. Finally at step 102, this carrier transport is detected in a detection region that is in carrier communication with the LASL.

Please replace the paragraph beginning on page 25, line 2, with the amended paragraph, as follows:

A data storage unit includes a data storage layer with multiple storage areas having a storage medium disposed thereon that changes between a plurality of states for writing and reading information. An array of beam emitters, such as laser light probes or near- field light sources, are spaced in close proximity to the data storage layer. A layer (LASL) adjacent to the

storage layer (~~LASL~~) generates carriers (electrons, holes or photons) in response to the light beams. Data is read by directing a light beam onto the data storage layer. The storage medium on the data storage layer affects the generation of carriers or alters the transport of carriers after generation by the LASL, depending upon the state of the storage medium. The carriers are detected in a detection region in carrier communication with the LASL to detect the presence of data. The detection region may comprise any type of region for detecting carriers, including a semiconductor diode junction and a photoconductive region. The presence of data in the storage areas is determined by the number of carriers transported across the semiconductor junction or the number of carriers transported in the photoconductive regions between electrodes.